

**DOCKET NO.: SA-517
EXHIBIT NO. 2V**

**NATIONAL TRANSPORTATION SAFETY BOARD
WASHINGTON, D.C.**

**ALPA PRESENTATION ON TERPS CRITERIA FOR
INSTRUMENT APPROACHES
(8 Pages)**

**Statement of Captain Wally Roberts, Air Line Pilots Association, NTSB Public Hearing
KAL 801, March 26, 1998**

Let me preface my statements here by pointing out that the Air Line Pilots Association is not a party to the investigation and does not represent the Korean Airline pilots. However, regardless of whatever determination the NTSB may make about the probable cause of this accident, the spotlight that has been placed on the Guam airport facilities has illustrated several deficiencies that, in our view, have important implications for airline operations at all U.S. airports. Therefore, my comments should not be taken as addressing specific aspects of this accident, but rather, in the context of our wider concerns over charting and instrument procedures.

Our assessment shows that the FAA's published procedures for Guam International Airport, and the resulting approach plate, are seriously flawed. The procedures do not comply with the agency's own standards. The approach plate contains several instances of misleading or inadequate text, and it compresses two different approach procedures onto one plate, which for this type of approach, can lead to confusion in interpreting the minimum altitude requirements.

Obviously, we cannot at this point say what role if any these deficiencies may have played in the KAL accident. Nevertheless, I will be pleased to discuss these issues in detail in response to your questions.

In closing, I would note that Controlled Flight Into Terrain, or CFIT, accidents are the single-most prevalent type of hull loss accidents worldwide. For that reason, ALPA supports the following policies to address CFIT hazards:

We want a working ILS and frequency-paired DME at all air carrier airports, ideally one for every runway approach.

Enhanced Ground Proximity Warning Systems should be installed on all commercial airliners.

All charts for instrument procedures must be carefully crafted to provide all essential information in a manner that is easily grasped by pilots, even in the most difficult operating conditions. In other words, the KISS principle should prevail.

The FAA should employ persons familiar with real-world airline operations, such as former airline pilots, in the offices that are responsible for drafting the approach procedures and ensuring that they are adequately translated into published charts and tables.

That concludes my prepared comments, I will be pleased to answer any questions you may have.

8260.3B EXCEPTS

Order 8260.3B United States Standard For Terminal Instrument Procedures (TERPS) \ Chapter 1. Administrative \ Section 1. Scope

6. WORD MEANINGS.

Word meanings as used in this manual

- a. Shall means that application of the criteria is mandatory.**
- b. Should means that application of the criteria is recommended.**
- c. May means that application of the criteria is optional.**

Order 8260.38 United States Standard For Terminal Instrument Procedures (TERPS) \ Chapter 1. Administrative \ Section 4. Establishment

Paragraph 140:

140. FORMULATION.

Proposed procedures shall be prepared in accordance with the applicable portion of this publication as determined by the type and location of navigation facility and procedure to be used. To permit use by aircraft with limited navigational equipment, the complete procedure should be formulated on the basis of a single navigation facility whenever possible. However, the use of an additional facility of the same or different type in the procedure to gain an operational advantage is permitted.

Order 8260.3B United States Standard For Terminal Instrument Procedures (TERPS) \ Chapter 1. Administrative \ Section 6. Identification of Procedures

Paragraph 161:

161. STRAIGHT-IN PROCEDURE IDENTIFICATION.

Procedures which meet criteria for authorization of straight-in landing minima shall be identified by the type of navigational aid(s) which provide final approach guidance and the runway to which the final approach course(s) are aligned; for example ILS Rwy 18R, LOC. BC Rwy 7, TACAN Rwy 36, LDA Rwy 4, NDB Rwy 21, VOR Rwy 15. VOR/DME Rwy 6, ILS or TACAN Rwy 9, etc. A slash (/) shall indicate that more than one type of equipment must be used to execute the final approach; for example VOR/DME, etc. When procedures are combined, the word 'or' shall indicate either type of equipment may be used to execute the final approach; for example, ILS or TACAN, ILS or NDB, VOR/DME or TACAN, etc. When the same final approach guidance is used to the same runway, the procedures shall be identified as follows: TACAN 1 Rwy 36, TACAN 2 Rwy 36. VOR 1 Rwy 18. VOR 2 Rwy 18, etc.

Order 8260.3B United States Standard For Terminal Instrument Procedures (TERPS) \ Chapter 2. General Criteria \ Section 8. Terminal Area Fixes \ 288. Using Fixes For Descent.

Paragraph 288c.(4)(c):

(c) Minimums shall be published both with and without the last stepdown fix, except for procedures requiring DME or NDB procedures which use a VOR radial to define the stepdown fix.

8260.19c

9/16/93

CHAPTER 8 EXCERPTS

PARA 807 b.

b. *Transition.* Instrument approach procedures shall NOT be developed that require "DME or RADAR" as the sole means for procedure entry if any other type of transition is available, unless specifically requested by ATC. It is not necessary to designate terminal routes which coincide with segments of the en route structure; however, these routes shall be designated when a lower altitude is authorized or when clarity is essential. With the exception of arc feeder or arc initial approach segments, terminal routes originating on an airway require the establishment of a named fix to identify the starting point of the route. The fix shall be common to the en route structure and instrument approach procedure.

813L.(7)

(7) On procedures where the course guidance and the stepdown fix are obtained from facilities which are of different types, publish two sets of minimums. Use one of the following titles to identify the dual minimums:

807 f. (3)

(3) DME frequencies are paired with the frequencies of the VOR, localizer, or MLS. When a non-paired DME is used in a VOR/DME, ILS/DME, etc., procedure, simultaneous reception of both facilities must be assured. This requires a standard Note indicating the DME location and the identification of both facilities: "DME from XYZ VORTAC. Simultaneous reception of I-ABC and XYZ DME required." DME frequencies are not paired with NDBs; and, DME antennas may or may not be collocated with the NDB. For NDB/DME SIAPs, use standard Note: "Simultaneous reception of ABC NDB and XYZ DME required."

814 h.

h. *Equipment Requirement Notes.* Determine the need for equipment notes after evaluating all SIAP segments, including missed approach. To avoid proliferation of equipment requirement notes, all IFR aircraft are assumed to have at least one VOR receiver. Therefore, the note "VOR required" is not appropriate. VOR, ILS, or other non-ADF approaches may require ADF for procedure entry or missed approach. Use standard Note: "ADF required." If radar vectoring is available, use standard Note: "ADF or radar required."

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JEPPESEN

26 JUL 96 (11-2)

CASPER, WYO

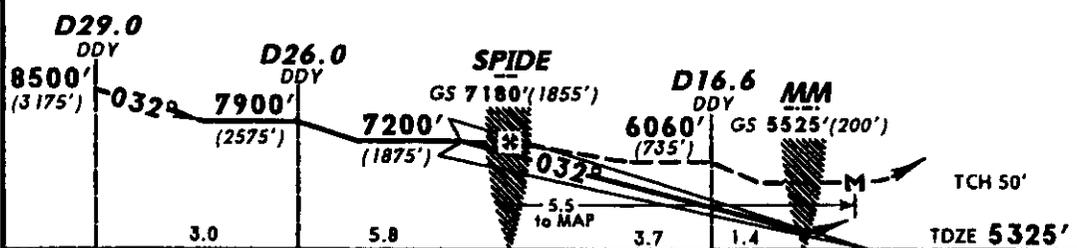
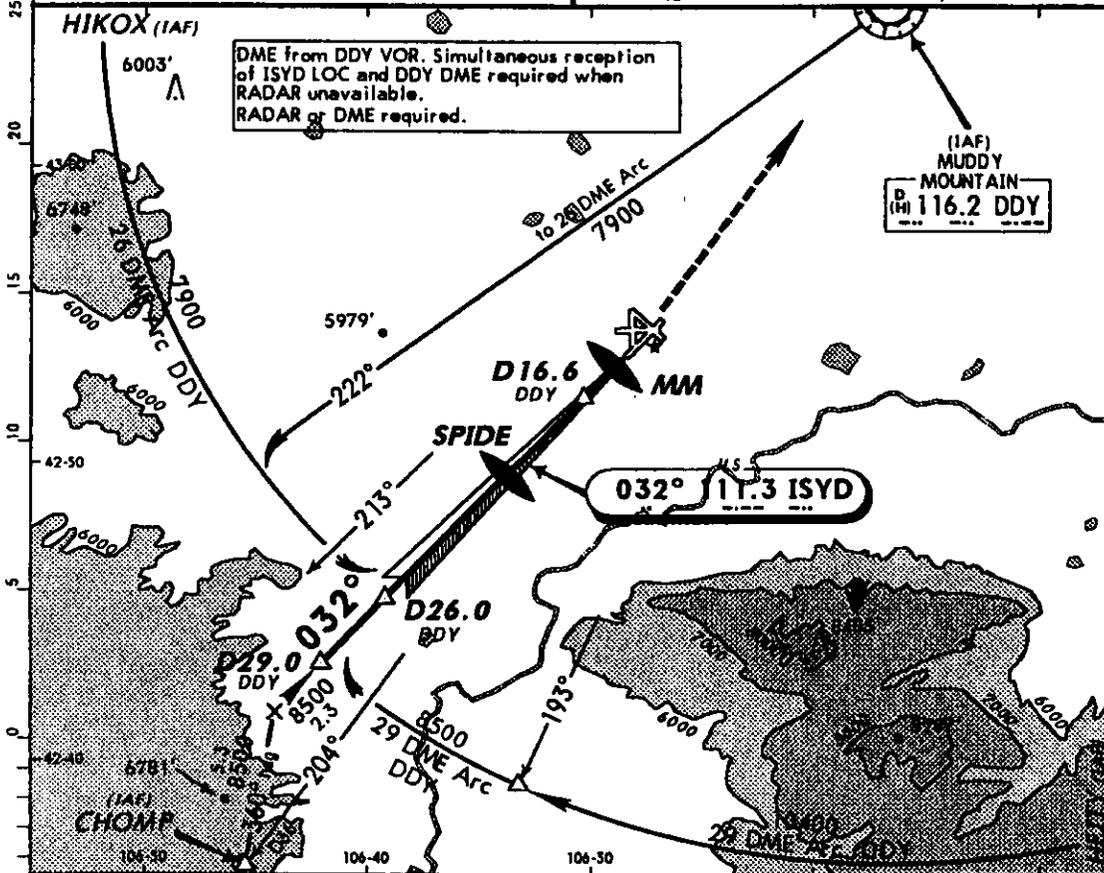
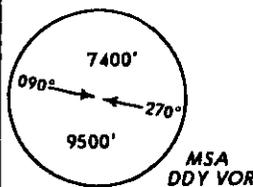
NATRONA CO INTL

ILS Rwy 3

LOC 111.3 ISYD

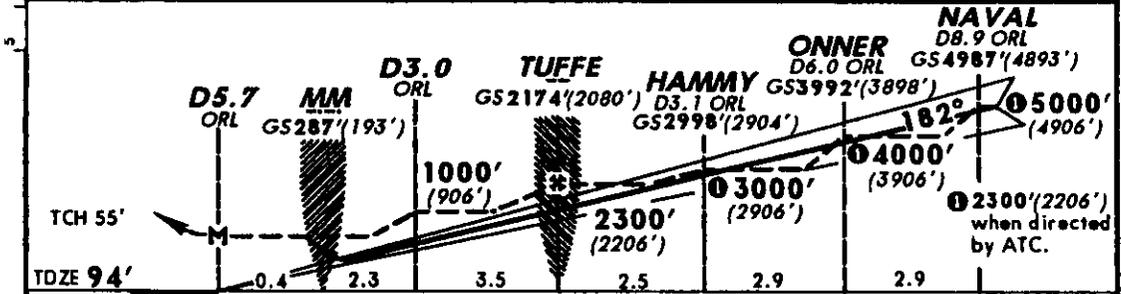
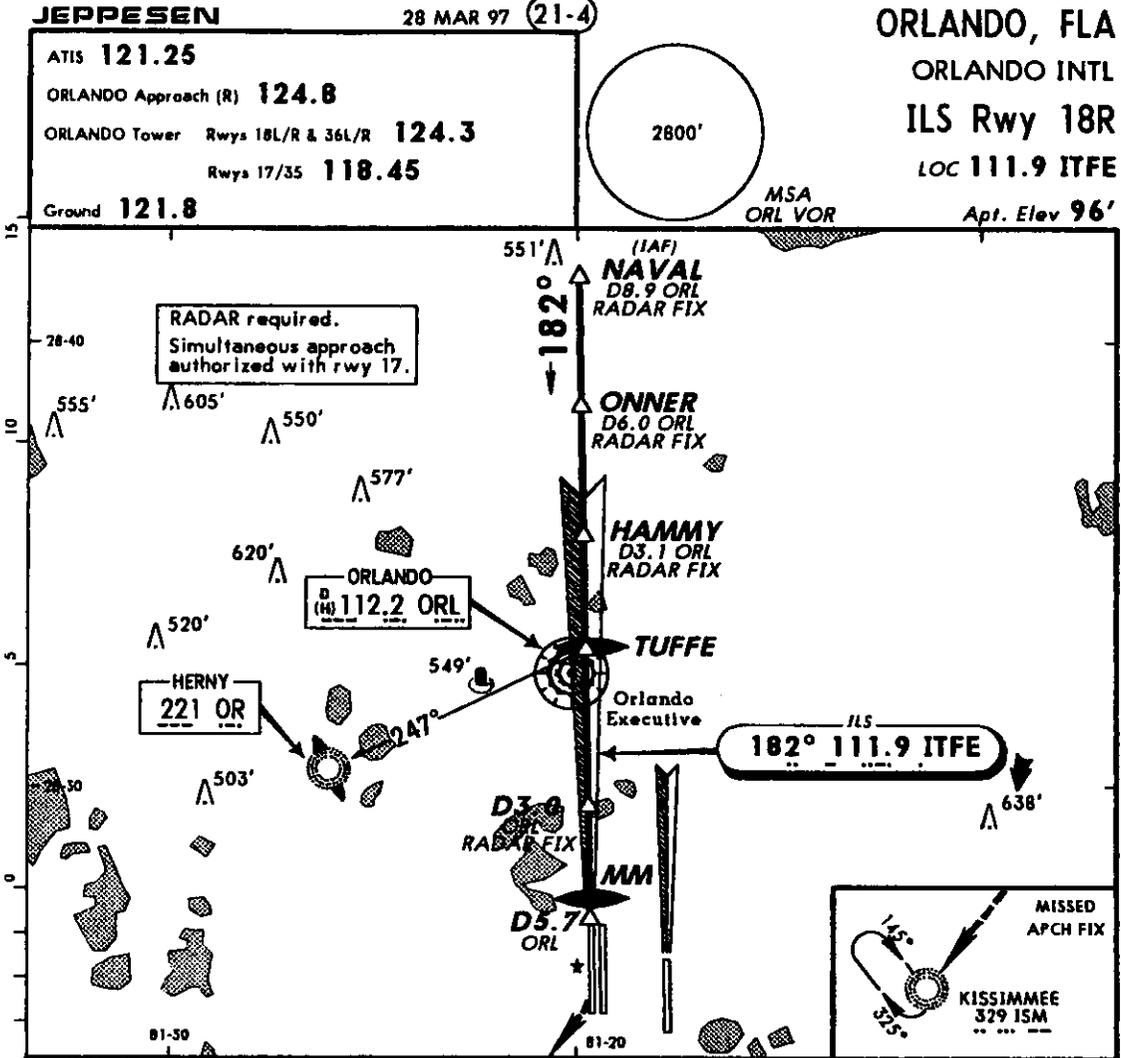
Apt. Elev 5348'

ATIS 126.15
 *CASPER Approach (R) 120.65
 DENVER Center (R) 135.6 when App Inop.
 *CASPER Tower 118.3
 *Ground 121.9
 CASPER Radio (LAA) CTAF 118.3 when Twr Inop.



MISSED APPROACH: Climb to 7500' direct DDY VOR and hold **NORTHEAST**, **RIGHT** turns, **205°** inbound.

STRAIGHT-IN LANDING RWY 3								CIRCLE-TO-LAND			
ILS		LOC (GS out)						With D16.6 DDY		Without D16.6 DDY	
DA(N) 5525'(200')		MDA(H) 5600'(275')		MDA(H) 6060'(735')							
		With D16.6 DDY		Without D16.6 DDY							
	FULL	RAIL or ALS out	RAIL out	ALS out	RAIL out	ALS out	Max Kts	MDA(H)	MDA(H)		
A					1/2	3/4	90	5780'(432')-1	6060'(712')-1		
B					1/2	3/4	120	5800'(452')-1	6060'(712')-1		
C	1/2	3/4			1 1/2	2	140	5800'(452')-1 1/2	6060'(712')-2		
D			3/4	1	1 3/4	2 1/4	165	5900'(552')-2	6060'(712')-2 1/4		
Gnd speed-Kts		70	90	100	120	140	160				



MISSED APPROACH: Climb to 500' then climbing RIGHT turn to 2000' direct ISM NDB and hold.

STRAIGHT-IN LANDING RWY 18R						CIRCLE-TO-LAND	
ILS DA(H) 294' (200')			LOC (GS out) MDA(H) 420' (326')				
FULL		TDZ or CL out	RAIL or ALS out	RAIL out	ALS out		
A						A	NA
B	RVR 18 or 1/2	RVR 24 or 1/2	RVR 40 or 1/4	RVR 24 or 1/2	RVR 40 or 1/4	RVR 50 or 1	
C							
D				RVR 40 or 1/4	RVR 50 or 1		
Gnd speed-Kts		70	90	100	120	140	160
GS		3.00°	379	487	541	649	757
							866

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21 JUL 95 (11-1)

NAPA, CALIF

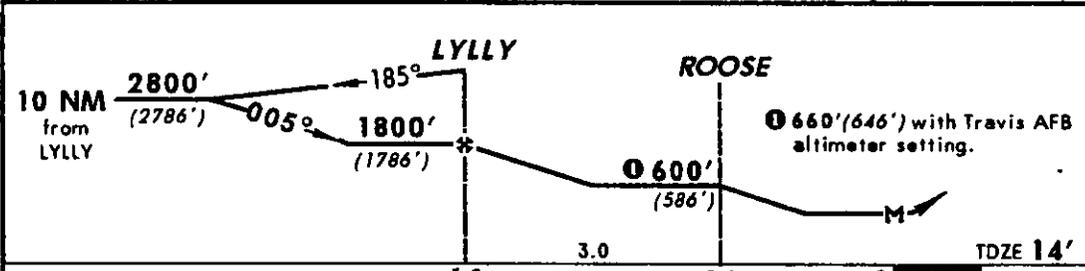
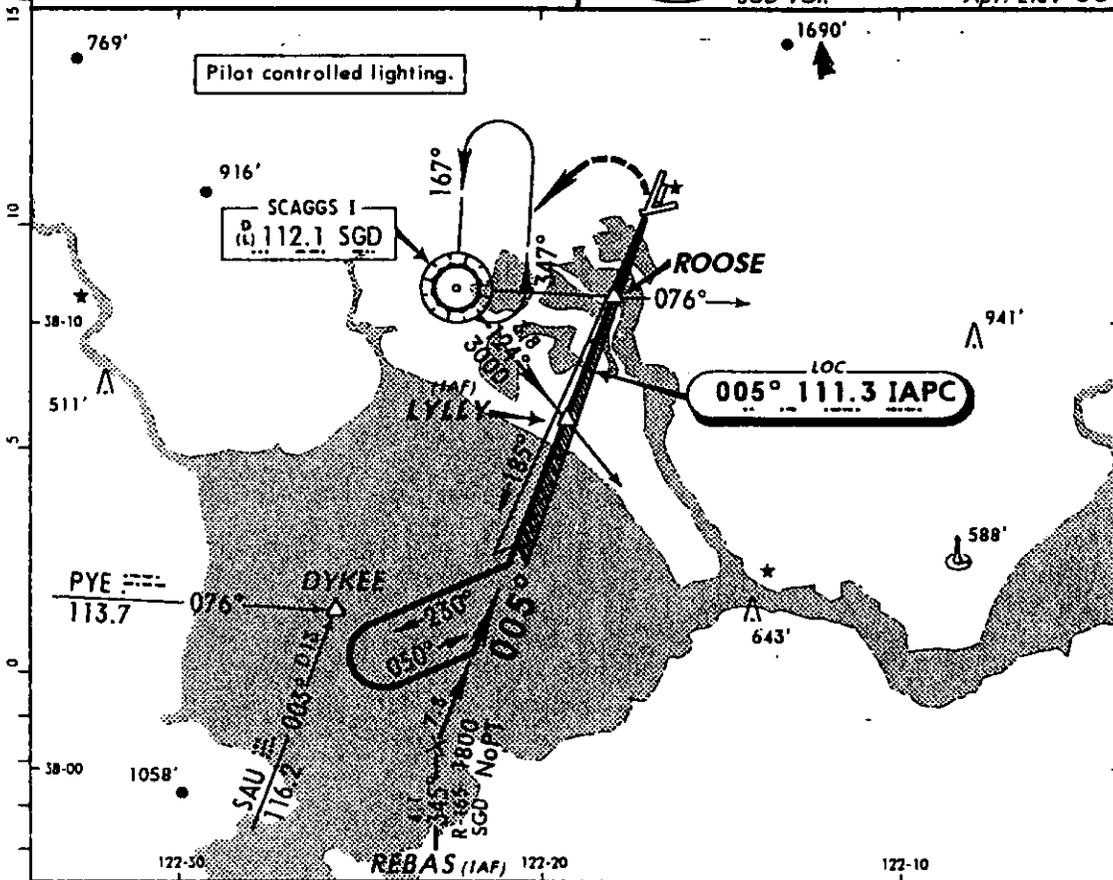
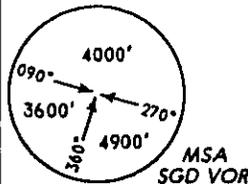
NAPA CO

LOC Rwy 36L

LOC 111.3 IAPC

Apt. Elev 33'

*ATIS 124.05
 OAKLAND Center (R) 127.8
 *NAPA Tower CTAF 118.7
 *Ground 121.7
 When Twr inop, use Travis AFB altimeter setting.



MISSED APPROACH: Climb to 440' then climbing LEFT turn to 3000' direct SGD VOR and hold.

STRAIGHT-IN LANDING RWY 36L										CIRCLE-TO-LAND			
		When Twr Operating		When Twr Operating		With Travis AFB Altimeter Setting		With Travis AFB Altimeter Setting		Not Authorized		Northeast of Rwy 36L & 24	
		MDA(H)		MDA(H)		MDA(H)		MDA(H)		When Twr Operating		With Travis AFB Altimeter Setting	
		360' (346')		600' (586')		420' (406')		660' (646')		Max		MDA(H)	
		With Roose		Without Roose		With Roose		Without Roose		Kts		MDA(H)	
		ALS out		ALS out		ALS out		ALS out				MDA(H)	
A										90	600' (567')-1	660' (627')-1	
B	3/4	1	3/4	1	3/4	1	3/4	1		120	620' (587')-1	680' (647')-1	
C			1 1/2				1 1/2			140	620' (587')-1 1/2	680' (647')-1 1/2	
D	1 1/4	1 3/4	1 1/4	1 3/4	1 1/4	1 3/4	1 1/4	1 3/4		165	1140' (1107')-3	1200' (1167')-3	
A M E N		Gnd speed-Kts		70	90	100	120	140	160				

JEPPESEN 27 JUN 97 (11-2)

TUCSON, ARIZ

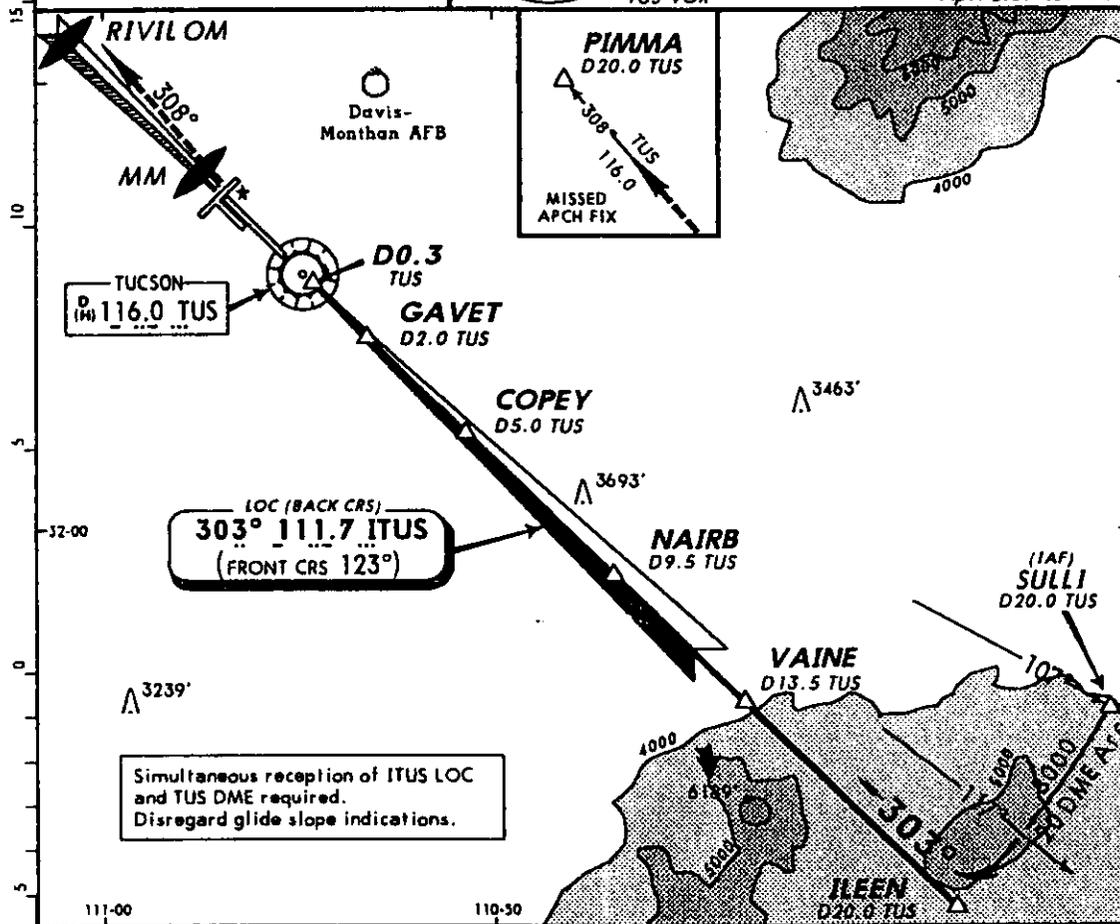
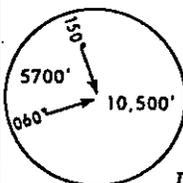
TUCSON INTL

LOC DME (BACK CRS) Rwy 29R

LOC 111.7 ITUS

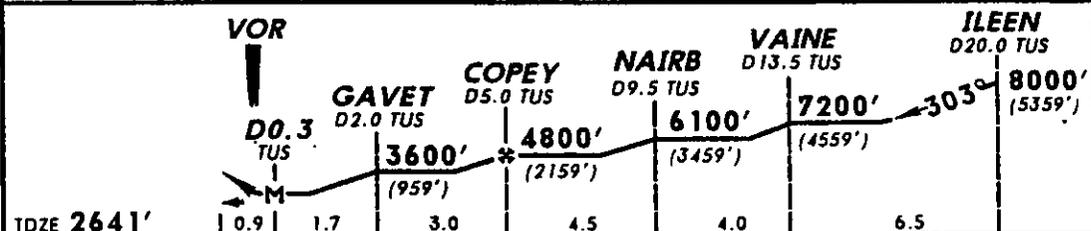
Apt. Elev 2641'

ATIS 123.8
 TUCSON Approach (R) 118.5
 TUCSON INTL Tower 118.3
 Ground 124.4



LOC (BACK CRS)
303° 111.7 ITUS
 (FRONT CRS 123°)

Simultaneous reception of ITUS LOC and TUS DME required. Disregard glide slope indications.



MISSED APPROACH: Climb to 6500' outbound via TUS VOR R-308 to PIMMA D20.0 TUS VOR.

STRAIGHT-IN LANDING RWY 29R		CIRCLE-TO-LAND	
MDA/H, 3120' (479')		Max Kts	MDA(H)
A	1	90	3120' (479') - 1
B	1	120	3120' (479') - 1
C	1 1/4	140	3160' (519') - 1 1/2
D	1 1/2	165	3200' (559') - 2

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6 SEP 96

(11-5)

Eff 12 Sep

PORTLAND, OREG

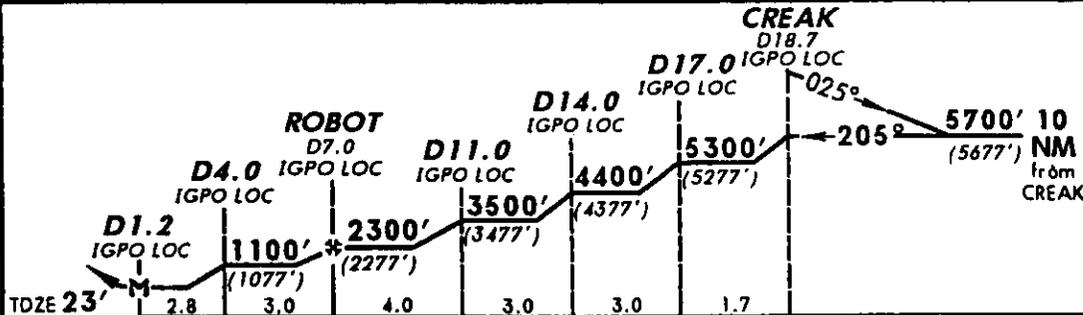
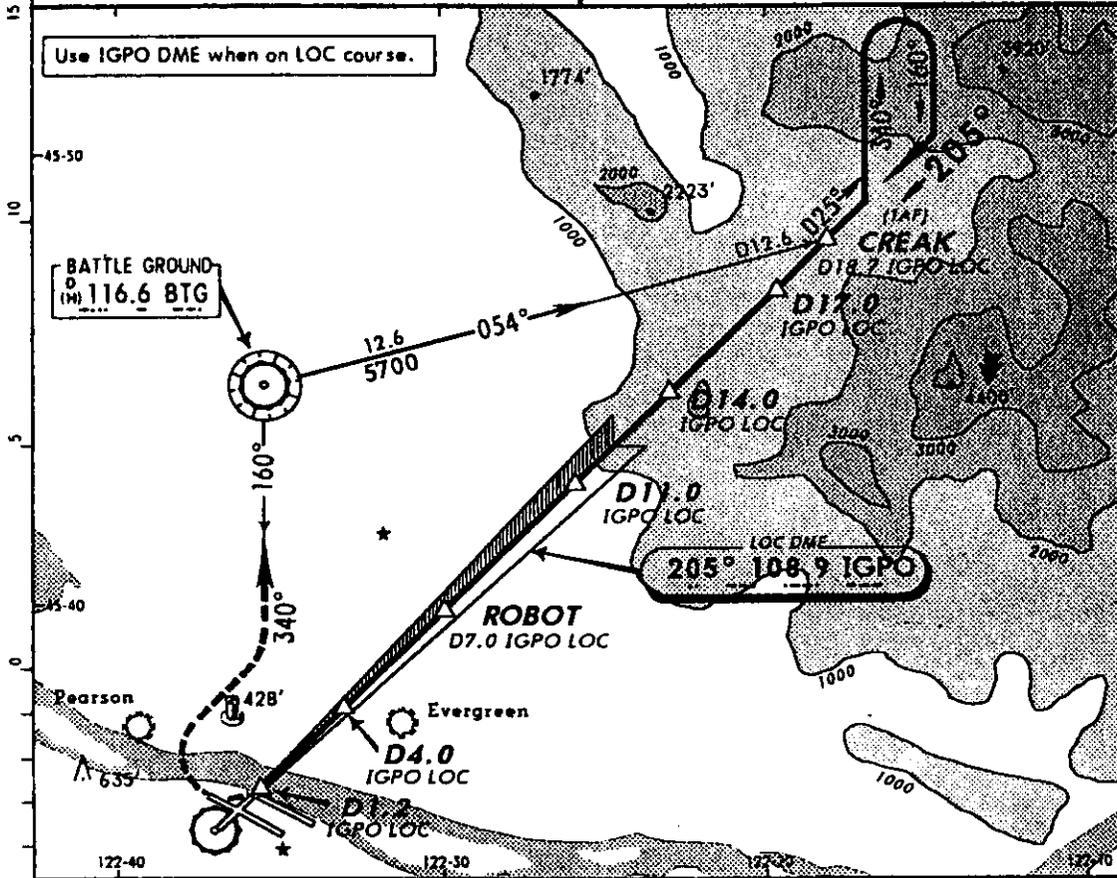
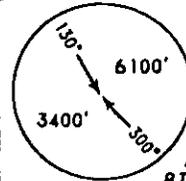
PORTLAND INTL

LOC DME Rwy 21

LOC 108.9 IGPO

Apt. Elev 27'

ATIS 128.35
 PORTLAND Approach (R) 133.0
 PORTLAND Tower 118.7
 Ground 121.9



MISSED APPROACH: Climbing RIGHT turn to 4000' inbound via BTG VOR R-160 to BTG VOR.

STRAIGHT-IN LANDING RWY 21		CIRCLE-TO-LAND	
MDA(M) 680' (657')		Max Kts	MDA'H
A	1	90	720' (693')-1
B		120	740' (713')-1
C	1 1/4	140	740' (713')-2
D	2	165	980' (953')-3